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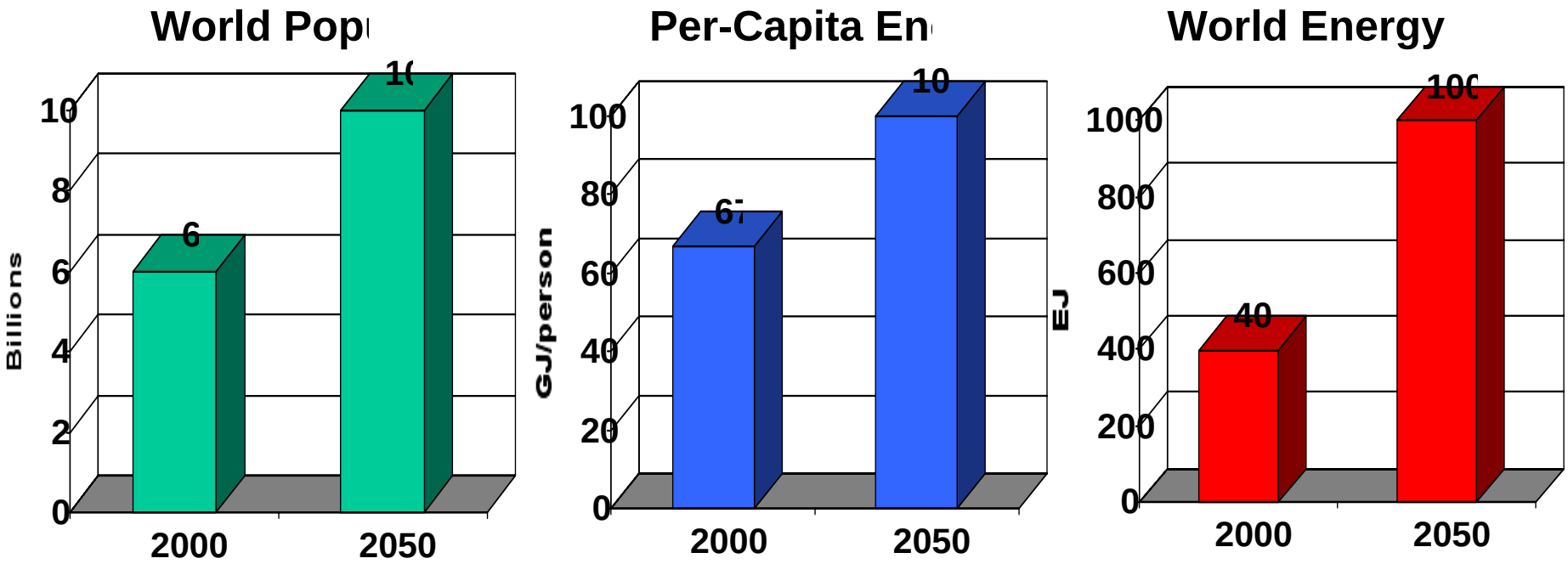
GIF Progress & Plans

Tokyo, Japan
September 20, 2002

Generation IV Initiative, Roadmap, and Energy Applications

Essential Role of Nuclear Energy

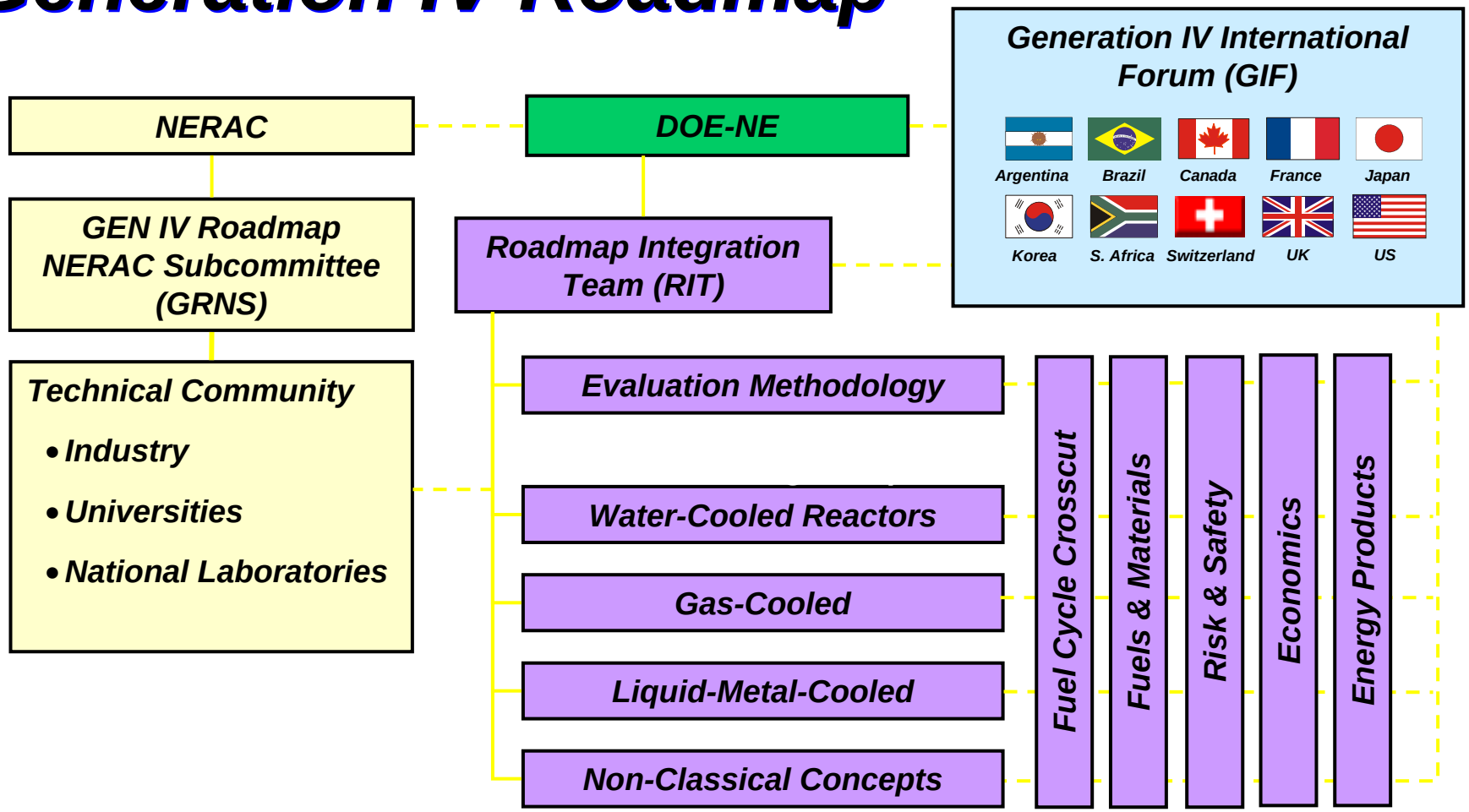


- *As population grows and standard of living increases*
  - *competition for limited energy resources will increase*
  - *endangering energy supply stability*

Generation IV International Forum

- *Development of one or more nuclear energy systems which:*
  - *are deployable by 2030*
  - *offer significant advances in*
    - » *sustainability*
    - » *safety and reliability*
    - » *proliferation and physical protection*
    - » *economics*
  - *can compete in various markets*
  - *offer various energy applications: electricity, hydrogen, clean water, and heat*

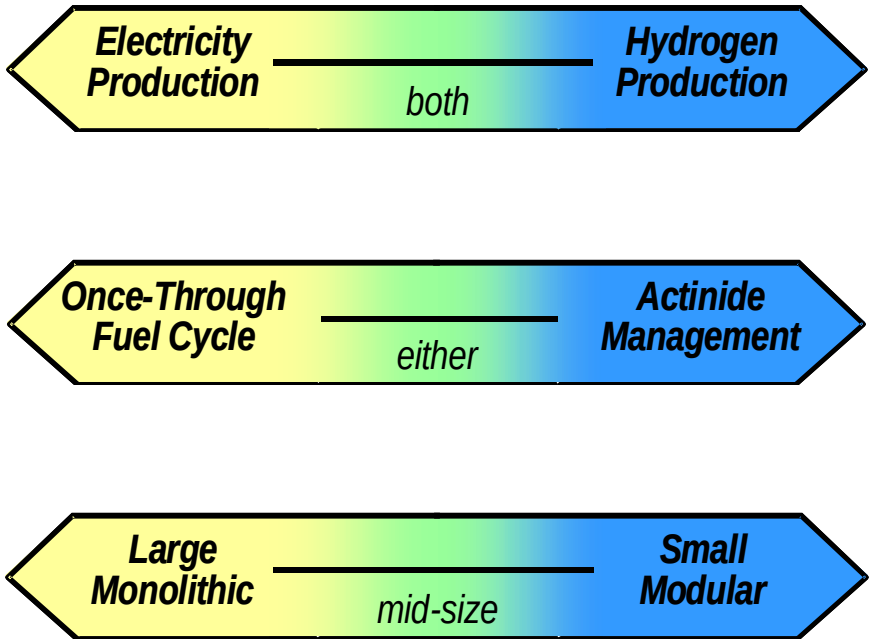
Generation IV Roadmap



Nearly 100 technical experts contributing to the R&D planning

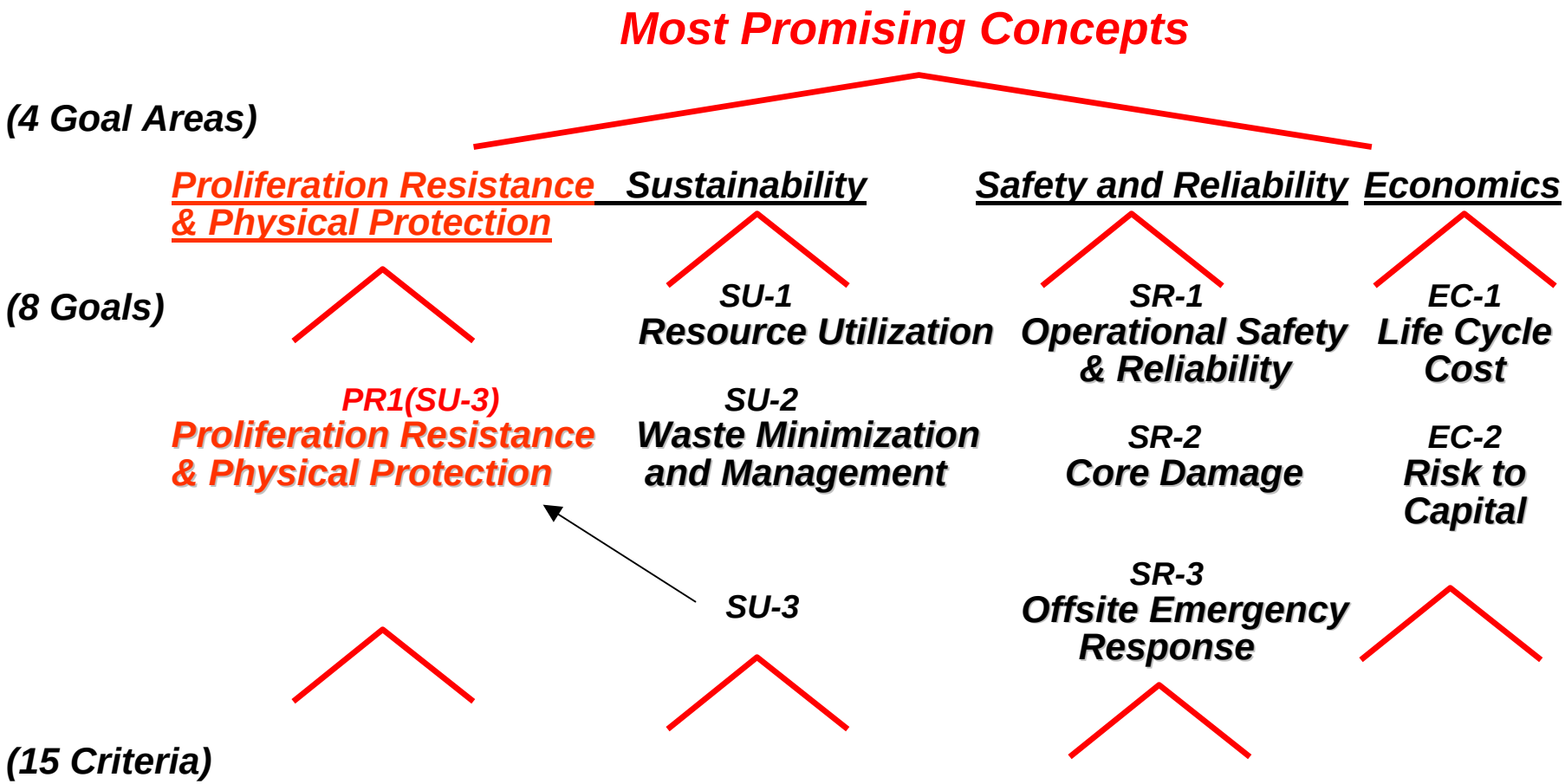
Energy Applications

- ***Generation IV concepts support multiple applications in differing markets***



Generation IV Concept Selections

Rollup of Criteria to Goals



Road Toward Concepts Selection

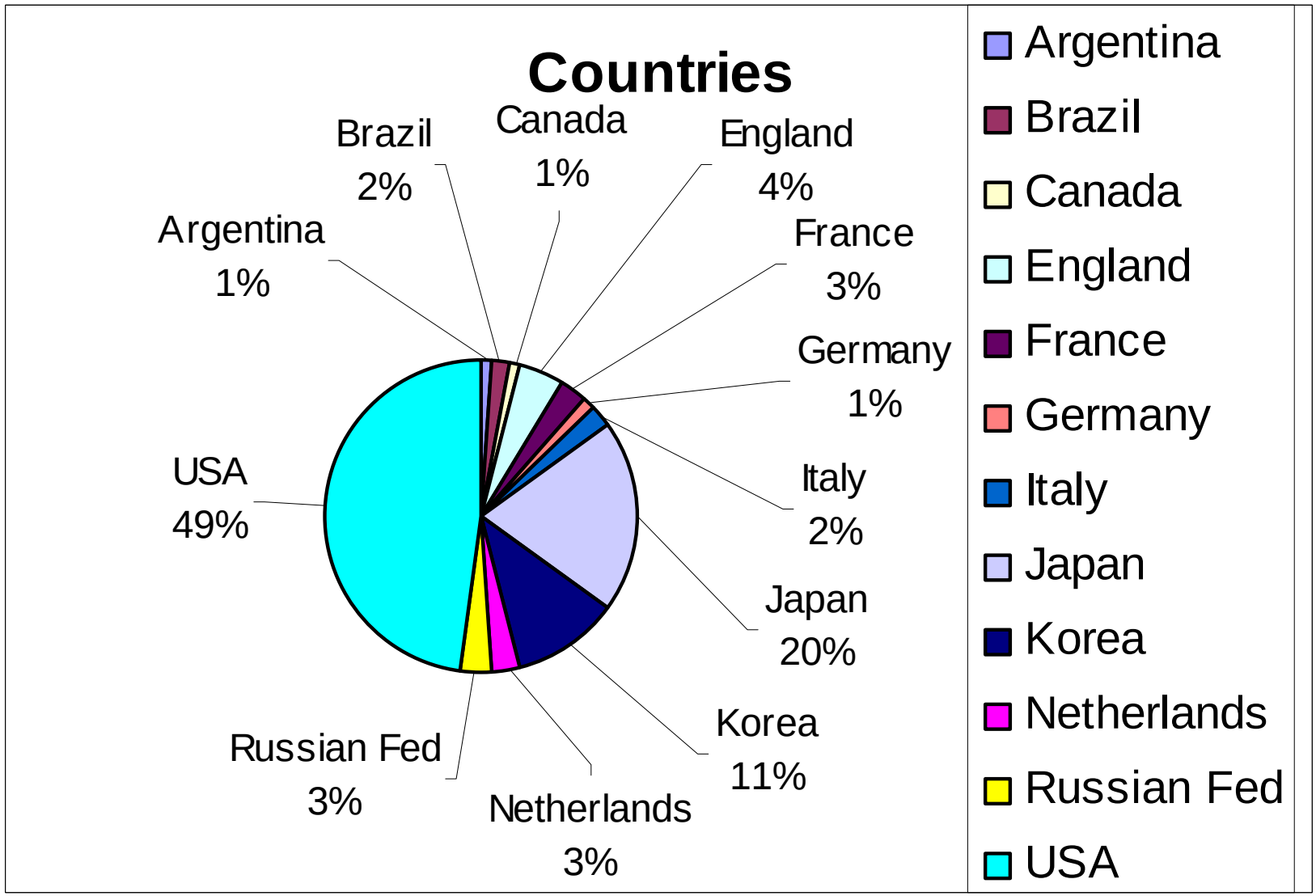
Roadmap Activities

- *Initial Request for Concepts: over 100 : 2000 Spring*
- *Screening for Potential: ~30 concept sets were organized and considered : 2001 Fall*
- *Final Screening : 20 concept sets were refined and evaluated in considerable detail : 2002 Spring*

Generation IV International Forum

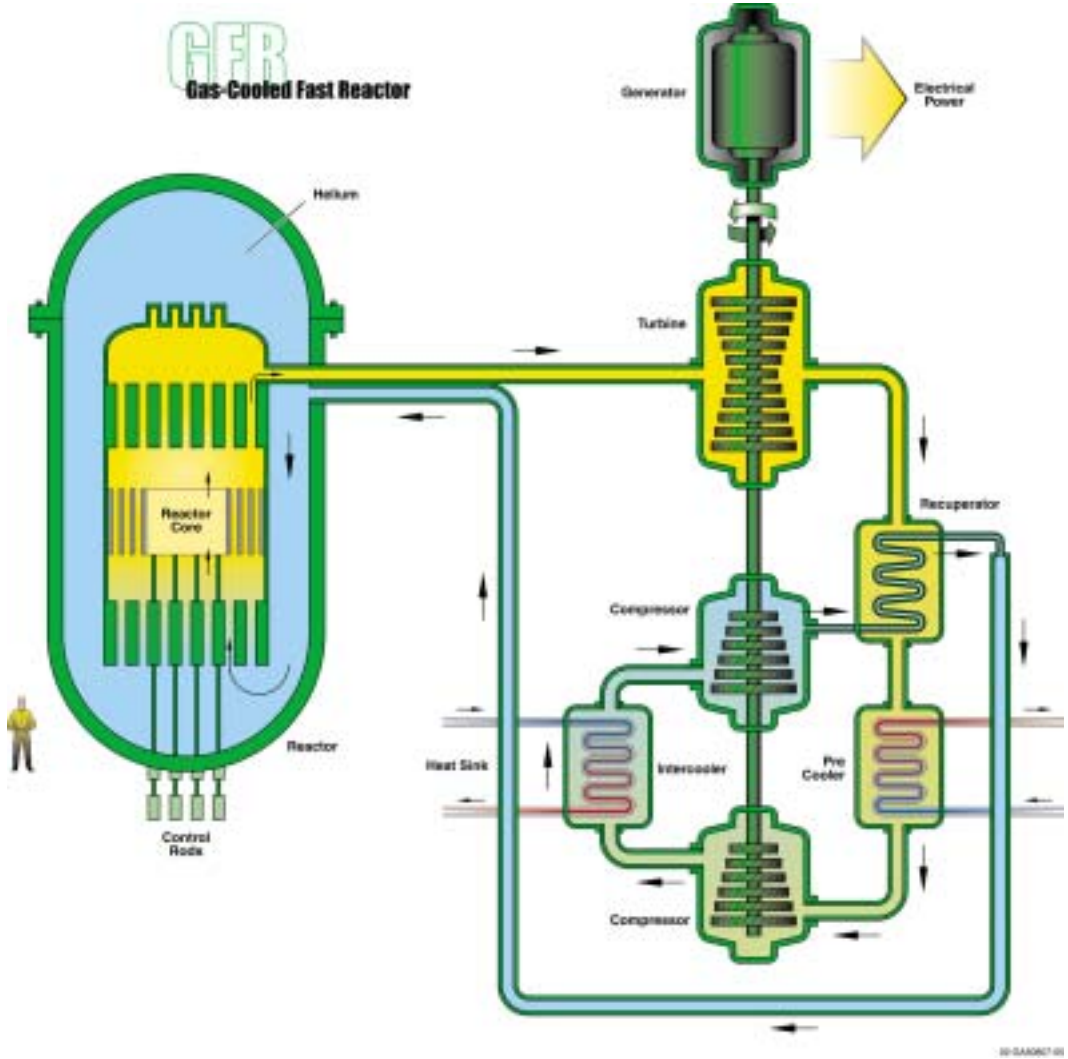
- *Review Roadmap numerical evaluation as a primary input to selection*
- *General agreements of the GIF members for the six systems based on discussions in May, Paris and July, Rio de Janeiro*

Generation IV Systems: Request for Information

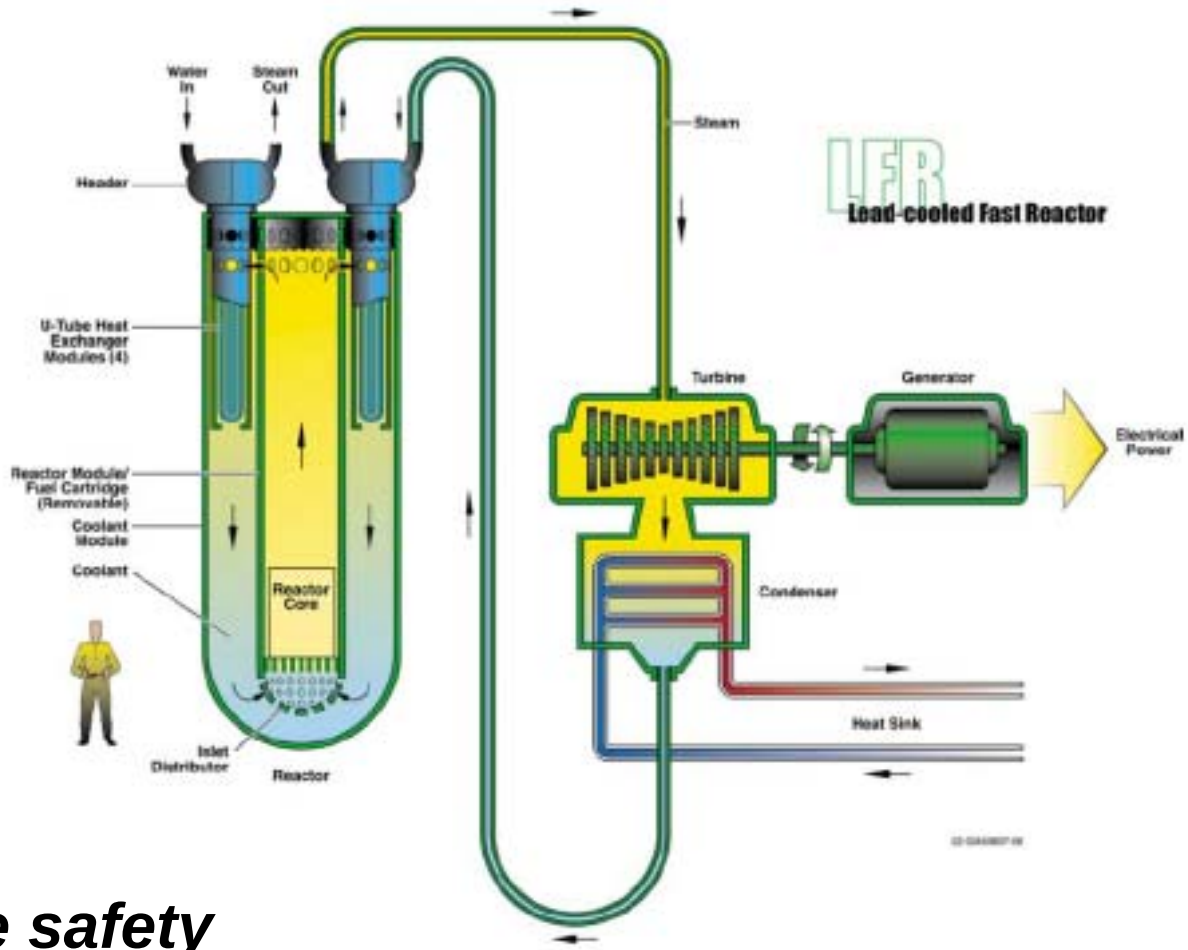


Generation IV Systems

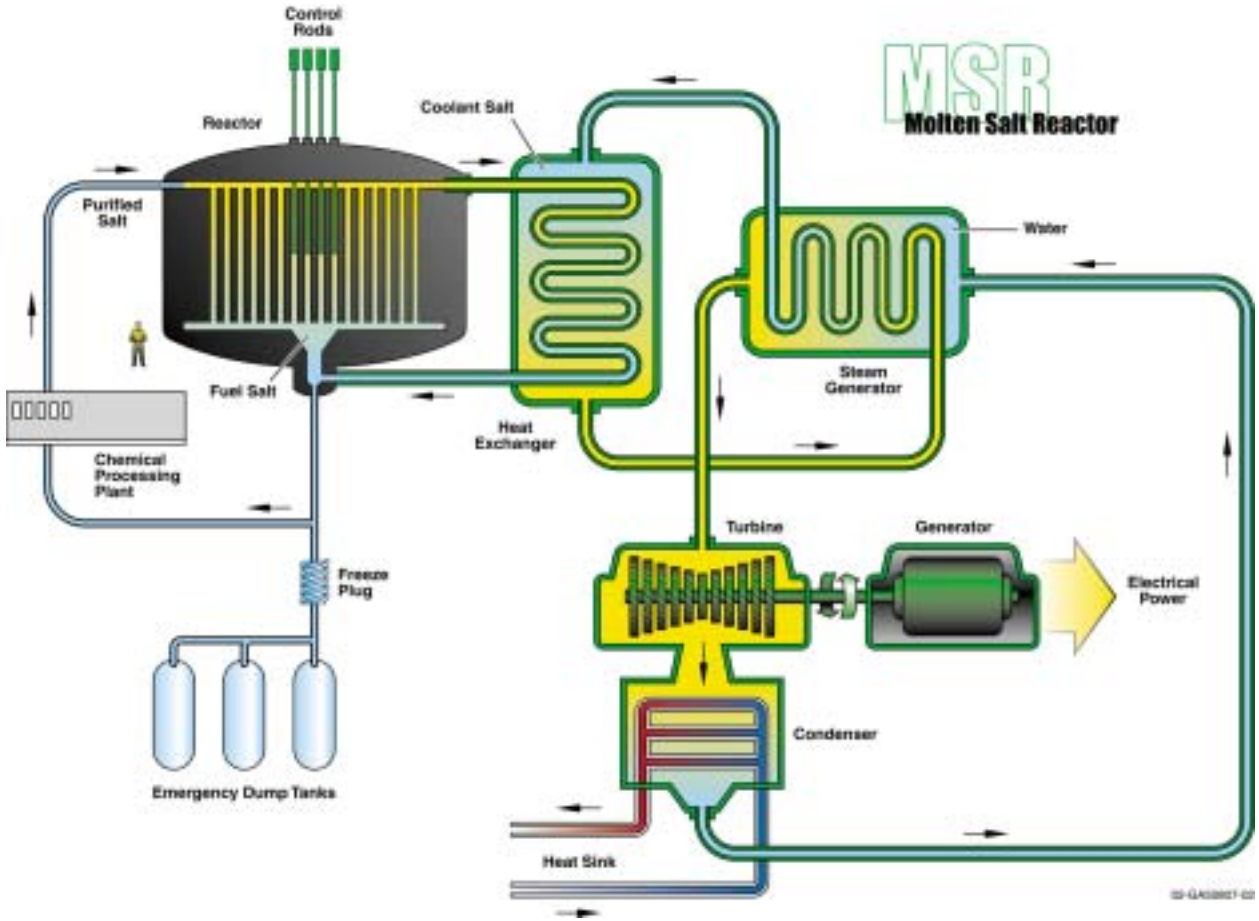
	Acronym	Coolant	Neutron
Gas-Cooled Fast Reactor	GFR	Gas	Fast
Lead-Cooled Fast Reactor	LFR	Liquid Metal	Fast
Molten Salt Reactor	MSR	Molten Salt	Thermal
Sodium-Cooled Fast Reactor	SFR	Liquid Metal	Fast
Supercritical Water-Cooled Reactor	SCWR	Water	Thermal – (Fast)
Very High Temperature Reactor	VHTR	Gas	Thermal



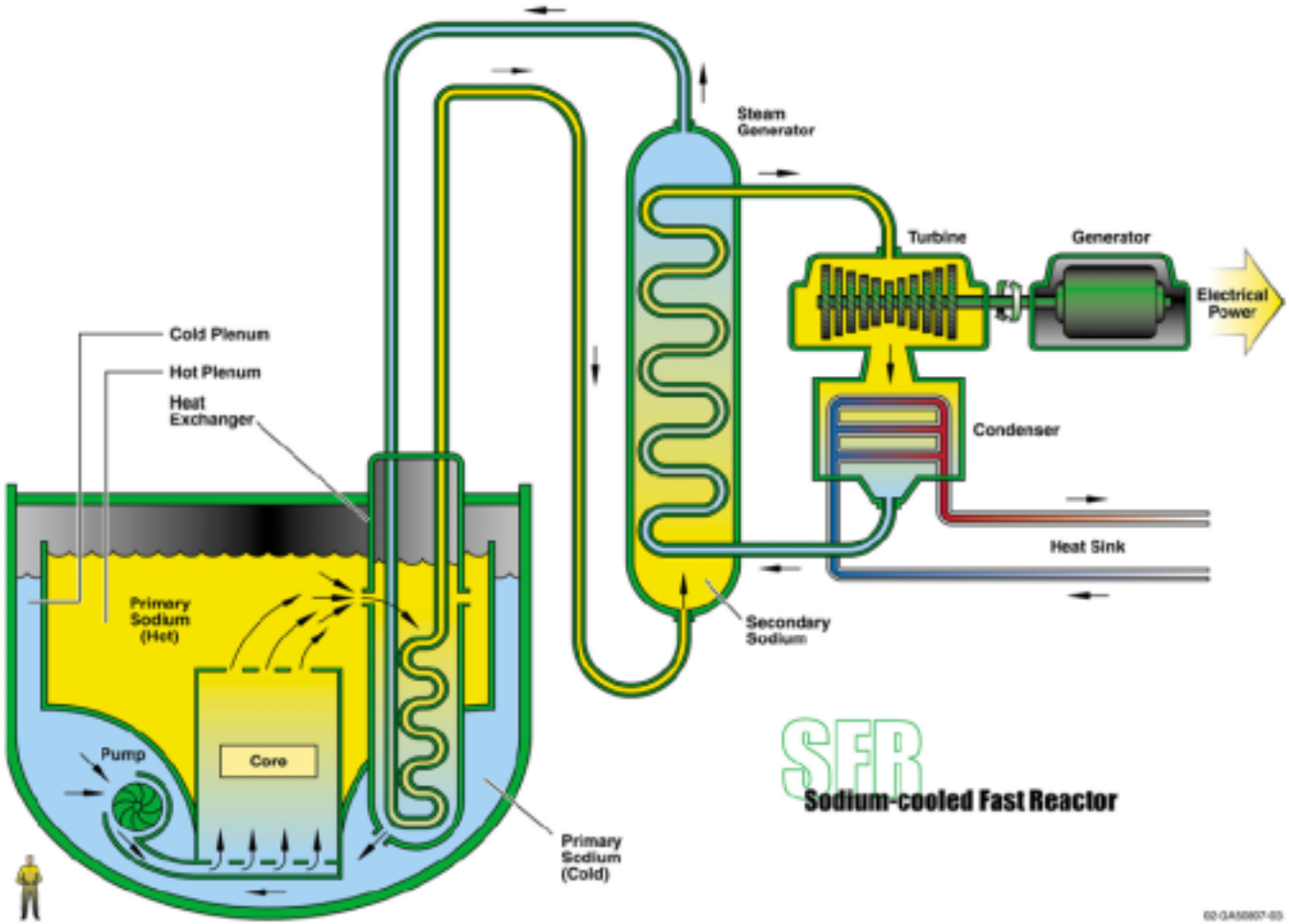
- ***Waste Minimization through Actinide Consumption***
- ***Proliferation Resistant***



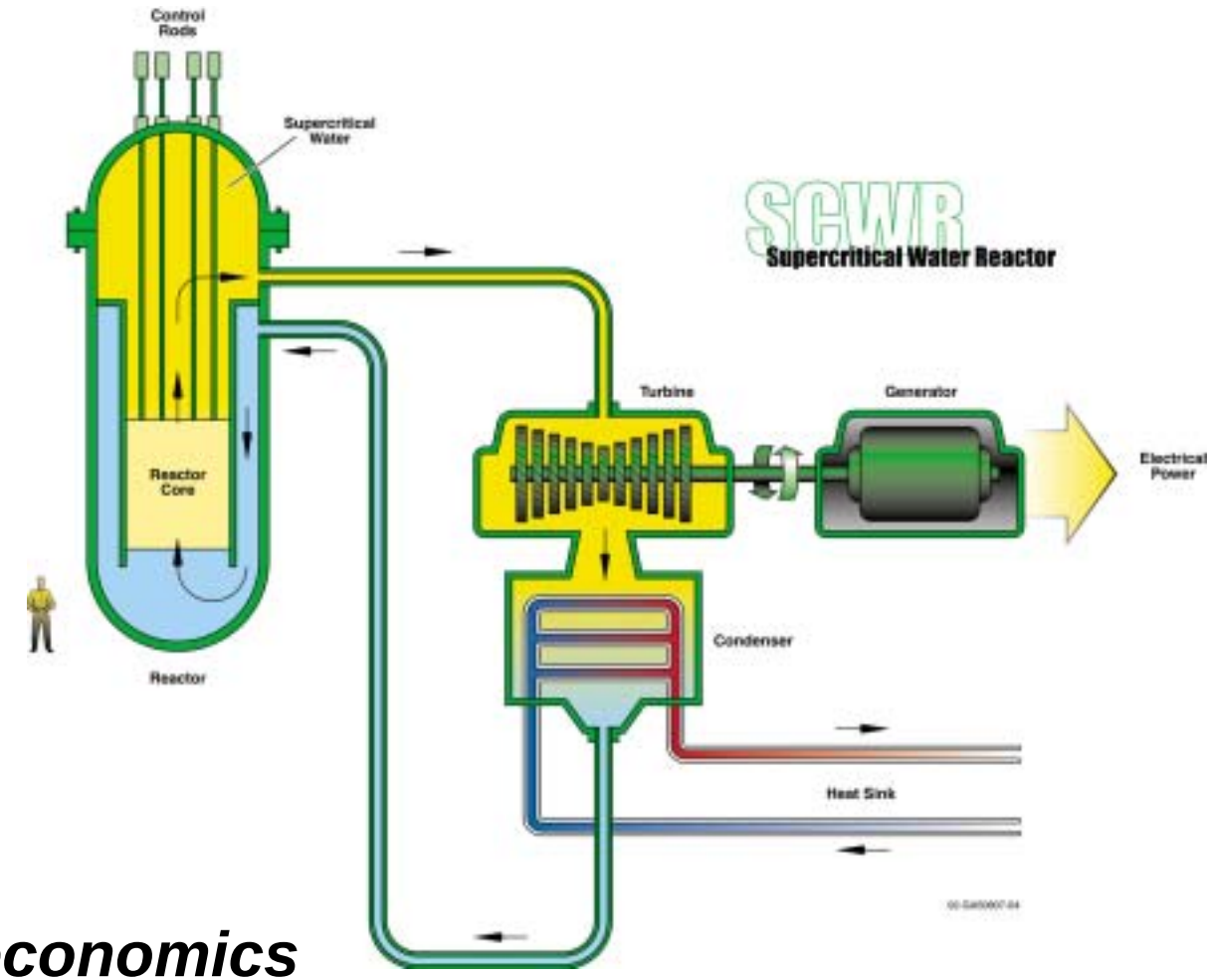
- ***Passive safety***
- ***Proliferation-resistance***
  - ***Regional fuel processing***
  - ***Removable, long-life core***



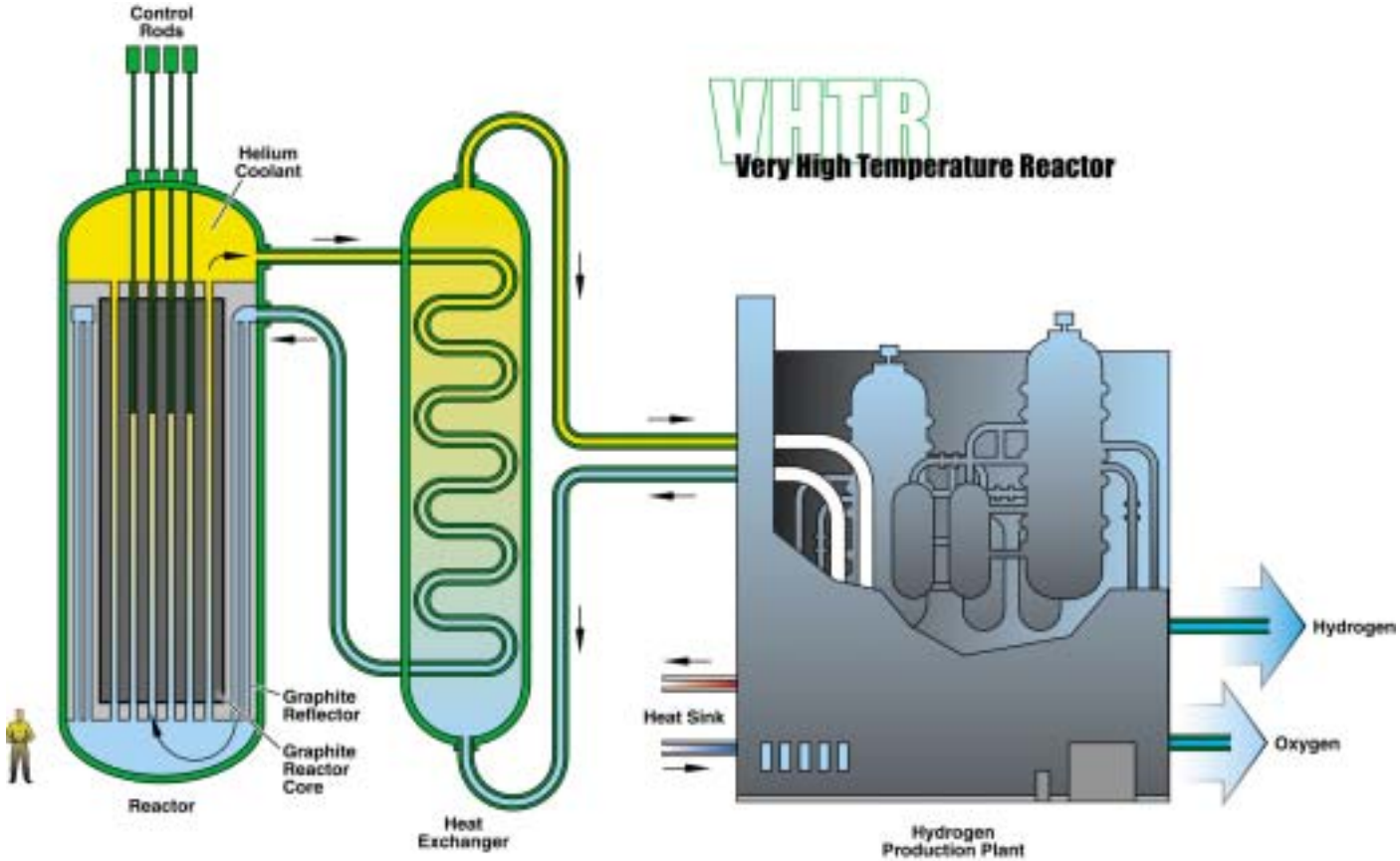
- ***Waste Minimization through Actinide Consumption***
- ***Proliferation Resistant***



- ***Waste Minimization through Actinide Consumption***
- ***Optimizes Resource Utilization***



- ***Excellent economics***
  - ***High efficiency***
  - ***Simplified plant***



- ***Very high temperature leads to:***
  - ***High thermal efficiency***
  - ***Ideal for hydrogen production***
- ***Inherent passive safety***

INTD Criteria and Selections

- ***Need to recognize systems with potential that are closer to deployment than Generation IV systems***
- ***Criteria for selection***
  - ***Technology is deployable by 2015***
  - ***Performance equal or better than current Advanced Light Water Reactor designs***
- ***Some INTD advances may support Generation IV development and vice versa***

International Near-Term Deployment
ABWR II
ACR-700
AP600
AP1000
APR1400
APWR+
CAREM
EPR
ESBWR
GT-MHR
HC-BWR
IMR
IRIS
PBMR
SMART
SWR-1000

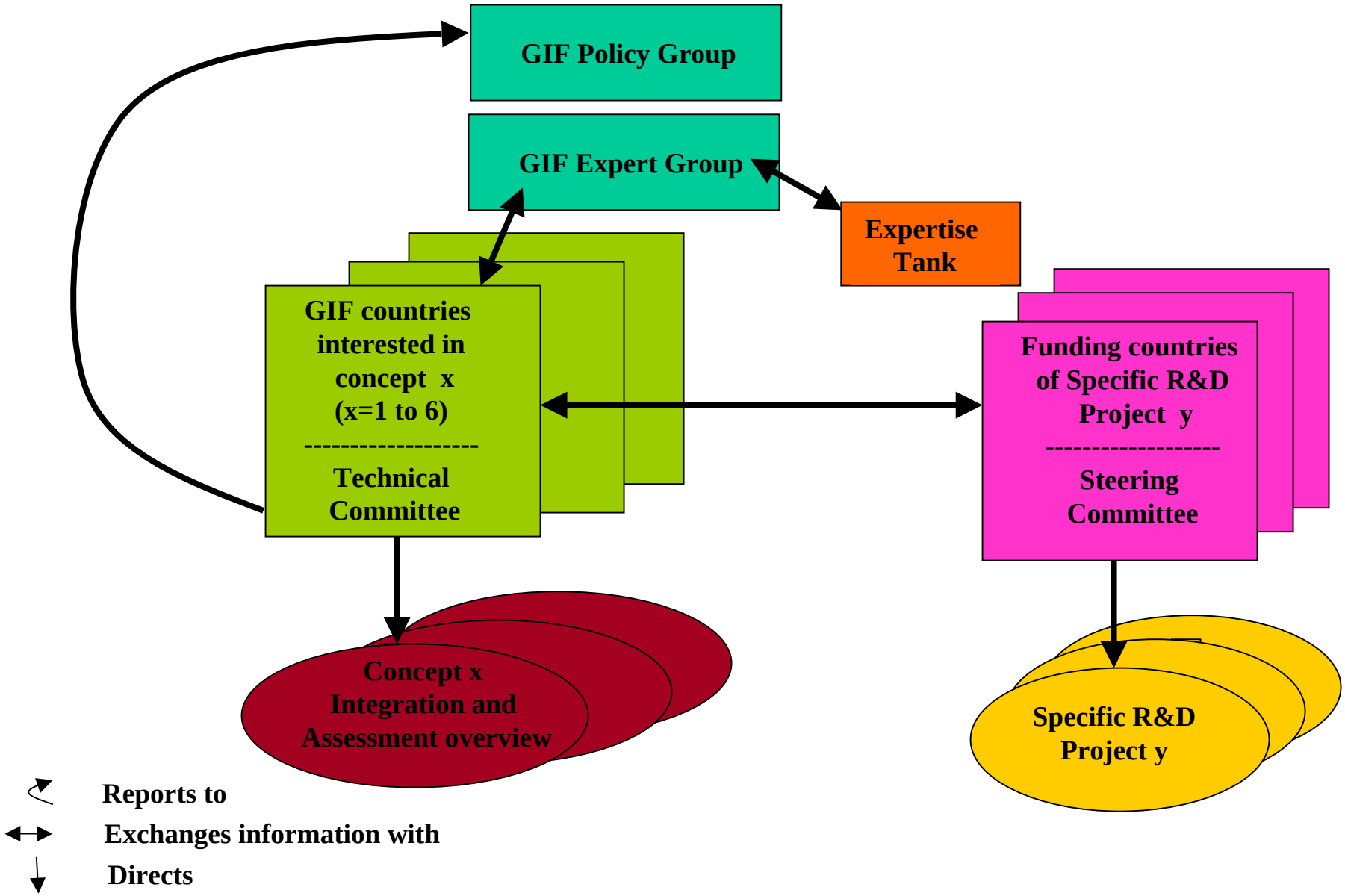
Conduct of R&D Collaborations

Organization and Conduct of R&D Collaborations

- **General objective: bring the selected Gen IV concepts to technical maturity.**
- **Mainly relies on a limited number of major key technologies to be developed and/or proven; this objective will require more R&D efforts than concept integration, at least at the beginning.**
- **Typical phases for Gen IV R&D: viability, performance, demonstration & optimization.**
- **R&D on several concepts must be undertaken at the same time in order to succeed with certainty; important to share R&D efforts.**

Organization and conduct of R&D collaborations

- **Proposed organization for conducting Gen IV R&D combines two aspects:**
  - ***Specific R&D Projects, for developing and/or proving key technologies; conducted by funding GIF countries, owning the property of the results*.**
  - ***Continuous concept integration and assessment, by concept technical committees, composed of GIF countries representatives, and reporting to the GIF Policy Group.***
- **Implementation of related organization and agreements, and initiate projects, by September 2003**


GIF Policy Group
GIF Expert Group
Expertise Tank
GIF countries interested in concept x (x=1 to 6)
Technical Committee
Funding countries of Specific R&D Project y
Steering Committee
Concept x Integration and Assessment overview
Specific R&D Project y
Reports to
Exchanges information with
Directs

Generation IV Communications Plan

Audiences

- ***Primary: those who can contribute to developing Generation IV designs***
  - ***Industry***
  - ***Researchers***
  - ***Regulators***
  - ***Etc.***
- ***Secondary: opinion-formers whose support may be important***
  - ***Public***
  - ***Environmental Groups***
  - ***Media***
  - ***Etc.***

Objectives and Key Messages

- *Increase awareness of GIF missions*
  - *Need for advanced nuclear systems to help meet growth in energy needs*
  - *Generation IV-enhancements in safety, security, sustainability, and efficiency*
- *Engage contributors to development work -how GIF works, plans, and sets milestones*
- *Respond to questions/interests/concerns by wider public-good quality information, readily accessible*

Strategy and Working Methods

- *GIF Secretariat*
  - *Central web site for public access*
  - *Broad timetable for announcements, etc.*
  - *"Core script" for communiqués*
- *Member countries and other stakeholders*
  - *Linked web sites*
  - *Locally tailored communiqués in own languages*
  - *Dialogues with industry, research bodies, etc.*
  - *Dialogues with interested media, environmental groups, etc.*